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Invasive Mussels Program

Jolene Trujillo

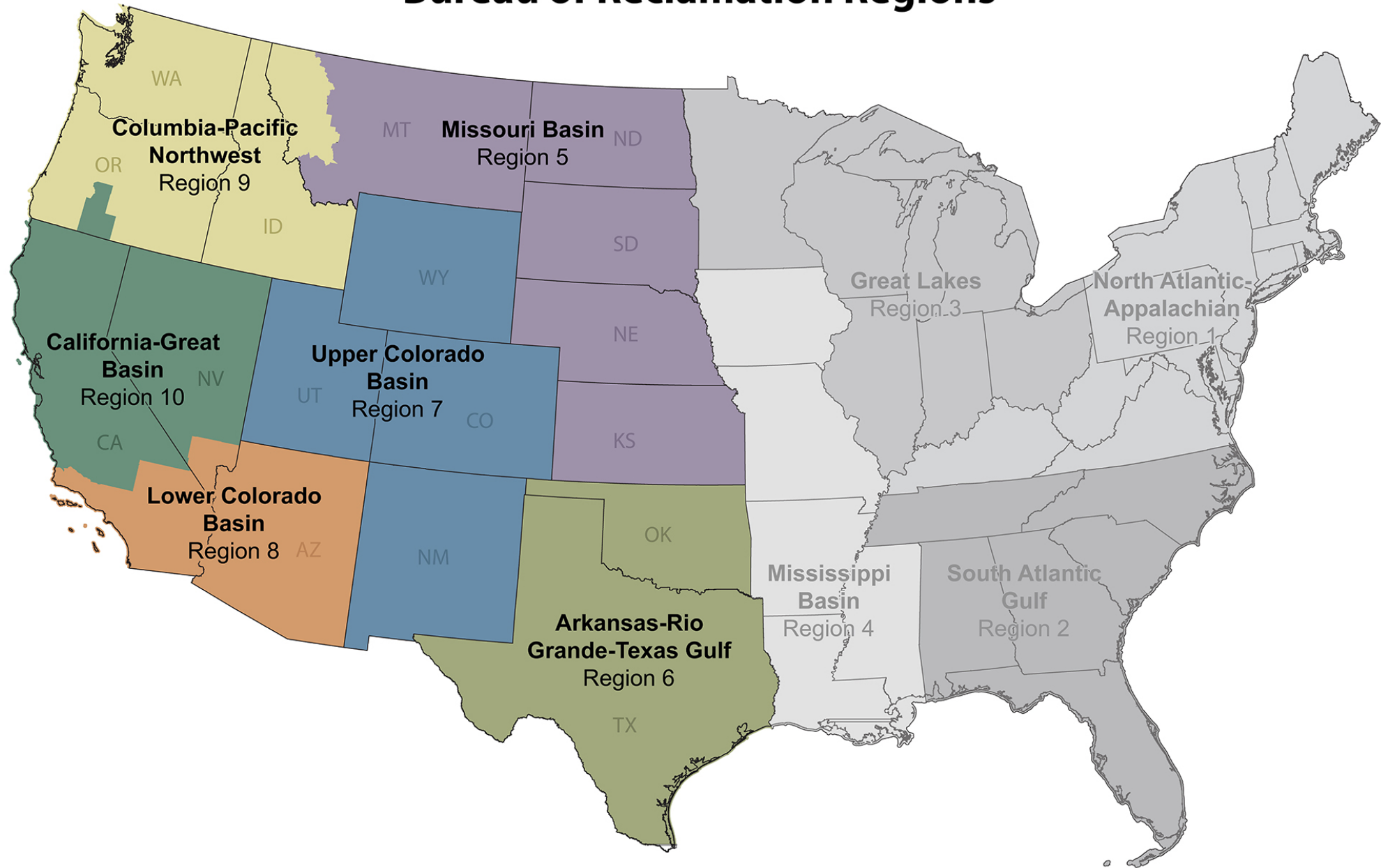
Integrated Pest Management & Invasive Species
Coordinator



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Bureau of Reclamation Regions



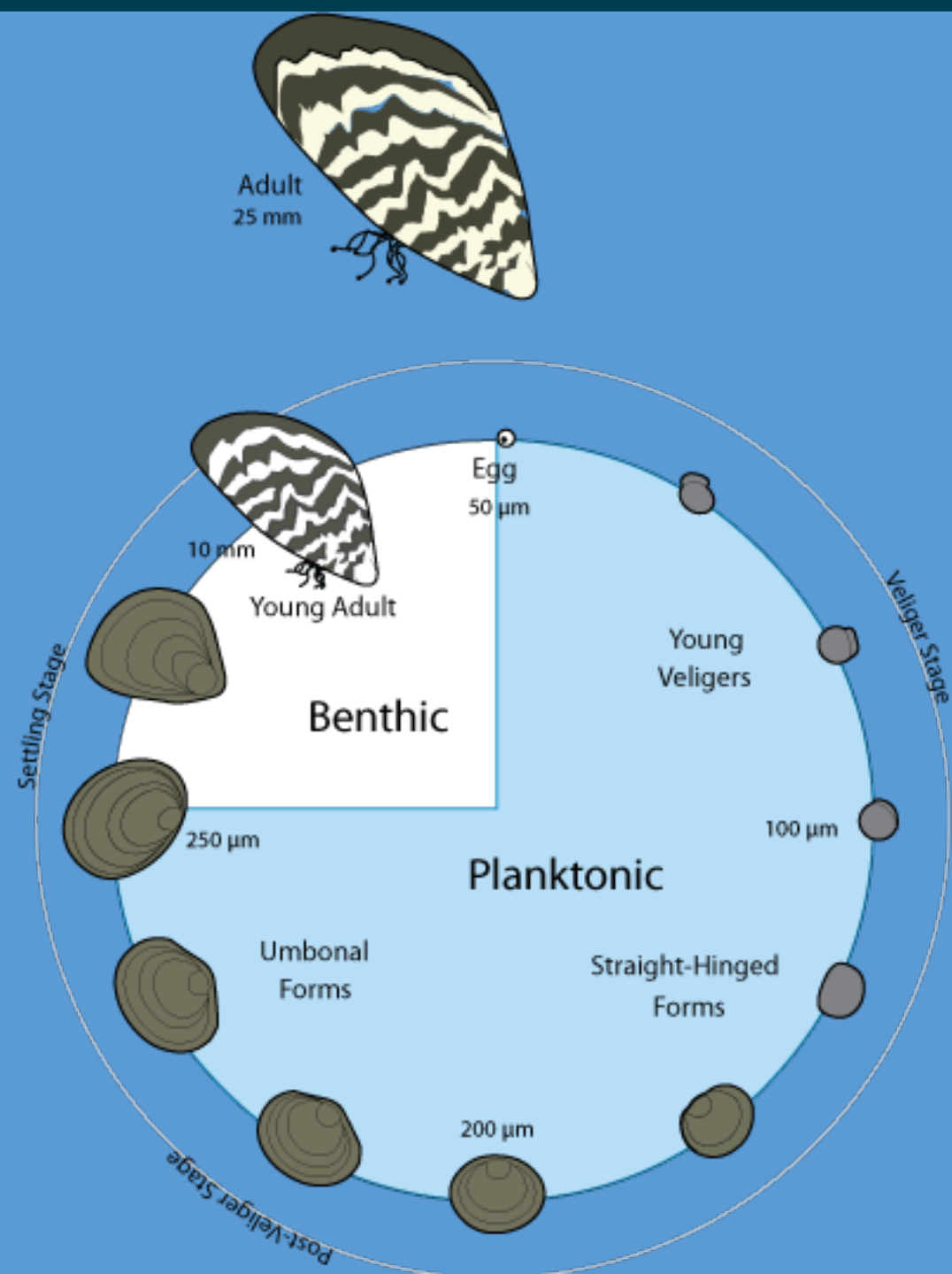
Zebra Mussel

Dreissena polymorpha



Quagga Mussel

Dreissena rostriformis bugensis



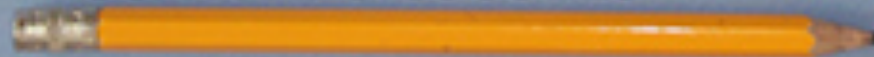
SIZE COMPARISON BETWEEN ZEBRA AND QUAGGA MUSSELS VERSUS NATIVE MUSSELS:



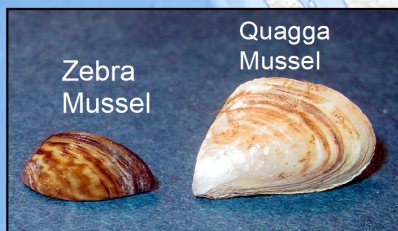
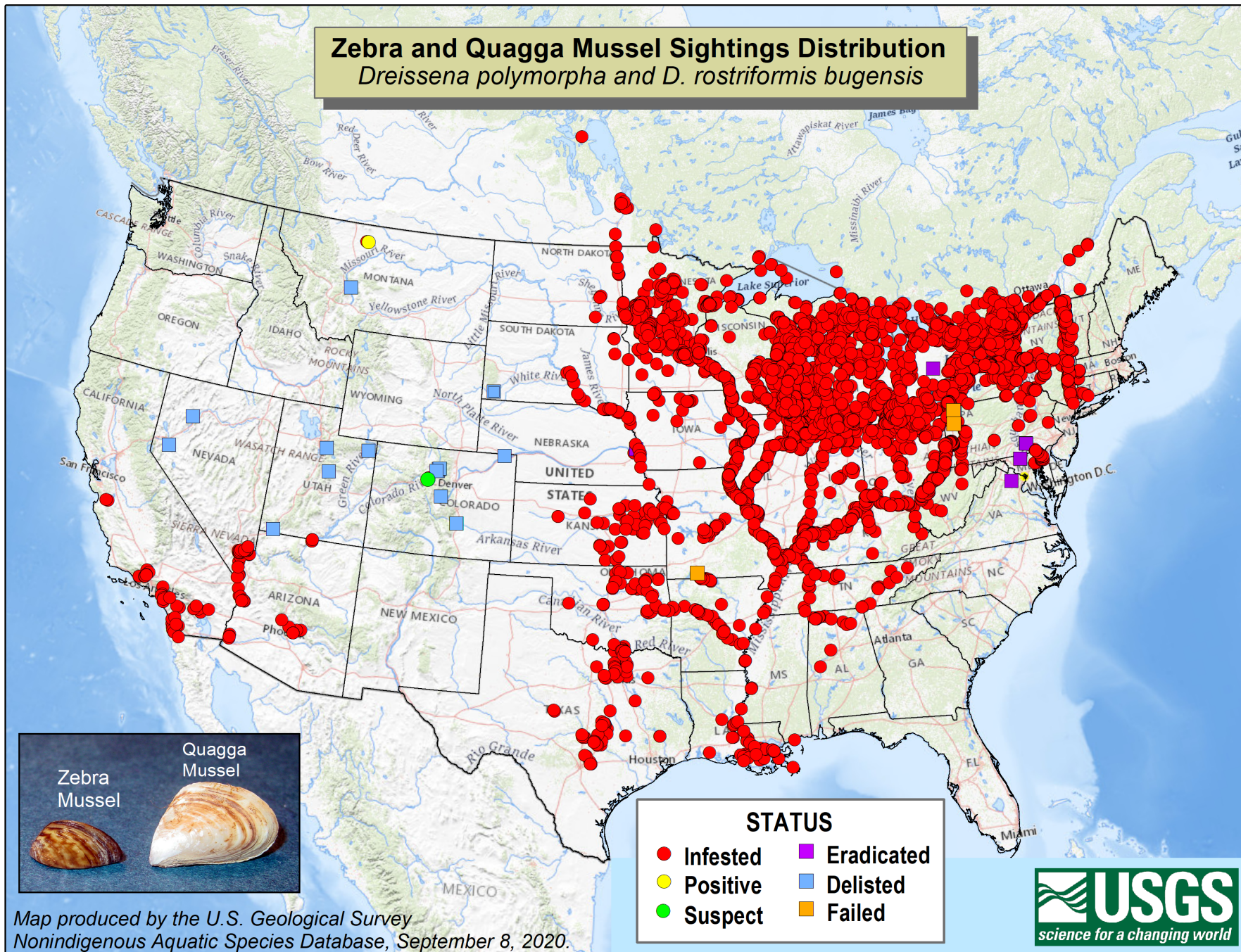
ZEBRA AND
QUAGGA
MUSSELS



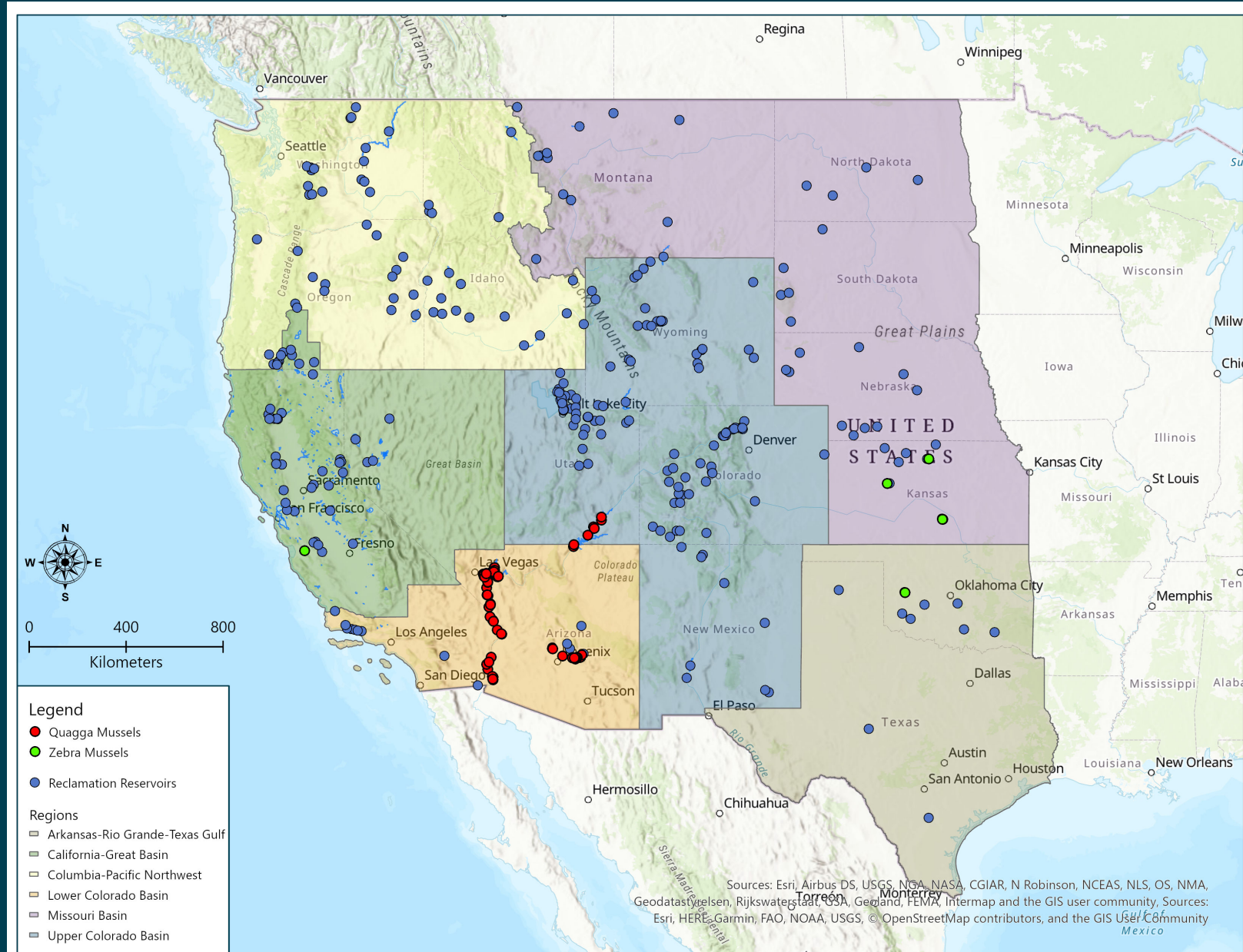
NATIVE MUSSELS



Zebra and Quagga Mussel Sightings Distribution *Dreissena polymorpha* and *D. rostriformis bugensis*



Reclamation Reservoirs with Mussels



Impacts at Reclamation

- Quagga mussels detected in Lake Mead in 2007
- Operational impacts to hydropower facilities along CO River
 - Increased maintenance
 - Overheating/ head loss
 - Unplanned outages



Mussel Impacts on Hydropower

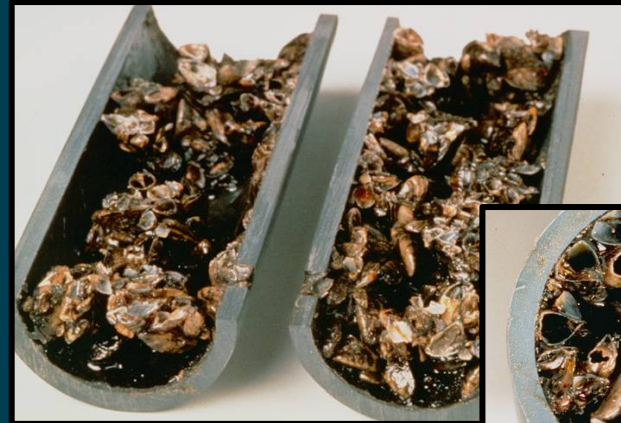
Mussel settlement and shells increase maintenance at hydropower plants in the following structures and systems:

- Intakes and penstocks
- Gates and valves
- Bypasses and air vents
- Cooling water systems
- Raw water fire protection systems
- Service and domestic water systems
- Instrumentation
- Drainage and unwatering systems





Davis Dam Spillway Bulkhead



Fouled trashrack



Intake screen



What is Reclamation doing?

- Creation of a Corporate Mussel Task Force
- Facility vulnerability assessments
- Support for watercraft inspection and decontamination through partnerships
- Continued outreach and education regarding the impacts of mussels
- Water sampling and analysis for early detection of mussels
- Research



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September 2020

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Special Agent in Charge

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- Immediate office of the Commissioner: [Solid Blue Box]
- Washington, DC: [Solid Light Blue Box]
- Washington, DC (located in Denver): [Solid Light Blue Box]
- Denver, Colorado: [Solid Light Orange Box]
- Regional Offices: [Dashed Blue Box]
- Denver and Regional Directors: [Solid Light Orange Box]
- Direct Communication: [Red Dashed Line]



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Invasive Mussels

Quagga and Zebra Mussels

Reclamation / Quagga and Zebra Mussels

INVASIVE MUSSELS

Quagga and Zebra Mussels

History and Background

Early Detection and Monitoring

Prevention Measures

Control Measures

Education

Research

Contacts

Quagga and Zebra Mussels

Two species of dreissenid mussels, *Dreissena polymorpha* (zebra mussel) and *Dreissena rostriformis bugensis* (quagga mussel), have become established in freshwater lakes, reservoirs, and rivers in the United States. Invasive dreissenid mussels pose significant challenges for Reclamation and all agencies and industries that manage water. Invasive mussels are prolific breeders and settle on or within water facility infrastructure such as water intakes, gates, diversion screens, hydropower equipment, pumps, pipelines, and boats. Infested water and hydropower infrastructure can fail or choke off water transmissions. Invasive mussels negatively impact the natural ecology, which can be detrimental to native and endangered species, including native fisheries.

Maintaining and operating water supply and delivery facilities, water recreation, and other water dependent industries and economies in mussel infested water bodies are dramatically more expensive and complex. Public recreation may also be severely impacted by mussel infestations, from shell fragments degrading swim beaches to increased requirements and cost for boaters to have their watercraft inspected and decontaminated, and potential impacts on populations of game fish.



GUIDANCE AND PROCEDURES

SOP: Field Sampling Methods for Invasive Mussel Early Detection

Chain of Custody for Mussel Samples

SOP: Preparation and Analysis of Water Samples for Dreissenid Mussel Veliger Detection

Improving Accuracy in the Detection of Dreissenid Mussel Larvae

Polymerase Chain Reaction: Preparation and Analysis of Veliger Water Sample^a

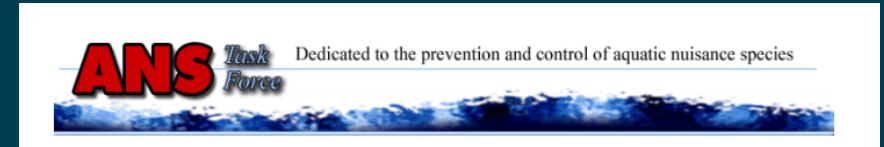
Environmental DNA (eDNA)
for Invasive Species





Reclamation is connected to the broader AIS Community

- Member of :
 - Aquatic Nuisance Species (ANS) Task Force
 - Western Regional Panel on ANS and ad hoc workgroups
 - Invasive Mussel Collaborative (IMC)
 - DOI Invasive Species Task Force
- Participate in various National Invasive Species Council (NISC) ad hoc workgroups



• Safeguarding the West Initiative

Safeguarding the West from Invasive Species

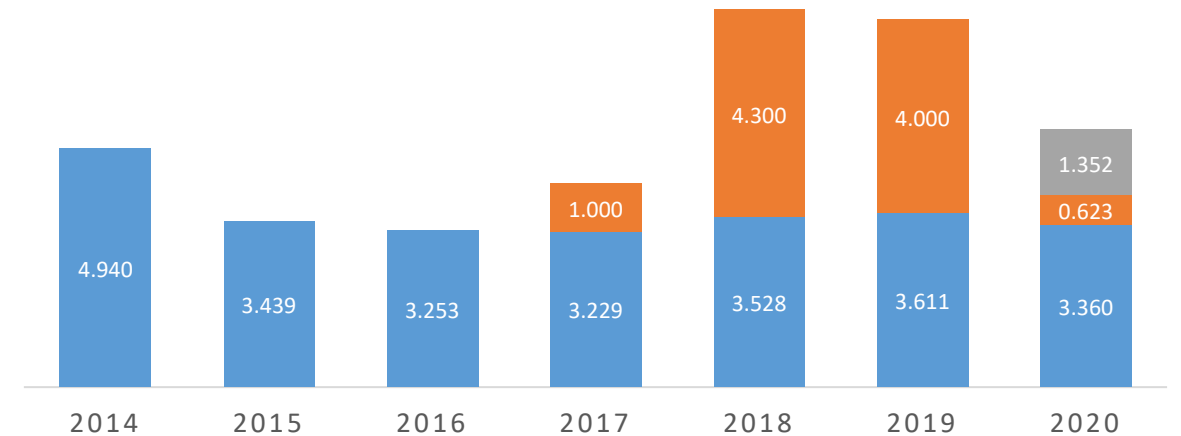
*Actions to Strengthen Federal, State, and Tribal
Coordination to Address Invasive Mussels*



• Reclamation's Mussel Spend Plan

RECLAMATION MUSSELS FUNDING (IN MILLIONS)

■ Reclamation Baseline ■ Spend Plan (Reclamation \$\$) ■ Congress Add-on



\$\$ for Watercraft Inspection/Decontamination

- Reclamation provides substantial resources for State, Tribal and other Federal Partners for watercraft inspection and decontamination programs



Facility Vulnerability Assessments

- Conducted at sites prior to mussel detection for planning purposes
- Identify potential impacts at Reclamation hydropower plants and dams
- Actual impacts will depend on the systems operation and levels of infestation
- Approximately 100 FVAs completed Reclamation-wide



Education and Outreach

- Reclamation has previously provided Stop Aquatic Hitchhiker signs to its regional and area offices
- Partners with State, Tribal and other Federal agencies on various education campaigns



**STOP AQUATIC
HITCHHIKERS!™**

Prevent the transport of nuisance species.
Clean all recreational equipment.
www.ProtectYourWaters.net

When you leave a body of water:

Clean all plants, fish, mussels and mud from boat.

Drain all ballast, motor, bilge, and livewells.

Dry everything completely before launching into another body of water.

Report Any Sightings
1-877-STOP-ANS (1-877-786-7267)

RECLAMATION
Managing Water in the West





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- Quagga and Zebra mussels impact water infrastructure
- Reclamation is engaged in a variety of efforts to combat the spread and risks associated with invasive mussels